

WHAT IS CLAIMED IS:

1. An opto-electronic device with an integrated light deflector, comprising:

a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals; and

a light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of the passive optical waveguide,

wherein a refractive index of the core under the predetermined shape is modified to deflect a light beam by applying a current or an electrical field to the light deflector.

2. The opto-electronic device with an integrated light deflector according to claim 1, wherein the predetermined shape is formed to make an angle of an emergent light beam different from that of an incident light beam.

3. The opto-electronic device with an integrated light deflector according to claim 2, wherein the predetermined shape is a triangle or a trapezoid.

4. The opto-electronic device with an integrated light deflector according to claim 1, wherein the light deflector is an array in which the predetermined shapes are repeatedly aligned, the array being an array having identical shapes, an array in which identical shapes have different incident angles of optical signals, or a combination thereof.

5. The opto-electronic device with an integrated light deflector according to claim 1, wherein the opto-electronic device comprises an active area for generating the optical signals.

6. The opto-electronic device with an integrated light deflector according to claim 5, wherein the cladding areas of the passive optical waveguide are composed of an InP material, and the core area and the active area are composed of an InGaAsP material.

7. The opto-electronic device with an integrated light deflector according to claim 1, wherein the predetermined shape is patterned by an embossing or engraving method.

8. An opto-electronic device with an integrated light deflector, comprising:

a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals; and

a light deflector having an electrode formed to have a predetermined shape by patterning at an upper portion of the upper cladding layer of the passive optical waveguide,

wherein a refractive index of the core under the predetermined shape is modified to deflect a light beam propagation by applying a current or an electrical field to the light deflector.

9. The opto-electronic device with an integrated light deflector according to claim 8, wherein the predetermined shape is formed to make an angle of an emergent light beam different from that of an incident light beam.

10. The opto-electronic device with an integrated light deflector according to claim 9, wherein the predetermined shape is a triangle or a trapezoid.

11. The opto-electronic device with an integrated light deflector according to claim 8, wherein the light deflector is an array in which the predetermined shapes are repeatedly aligned, the array being an array having identical shapes, an array in which identical shapes have different incident angles of optical signals, or a combination thereof.

12. The opto-electronic device with an integrated light deflector according to claim 8, wherein the opto-electronic device comprises an active area for generating the optical signals.

13. The opto-electronic device with an integrated light deflector according to claim 12, wherein the cladding areas of the passive optical waveguide are composed of an InP material, and the core area and the active area are composed of an InGaAsP material.

14. The opto-electronic device with an integrated light deflector according

to claim 8, wherein the predetermined shape is patterned by an embossing or engraving method.

15. A wavelength tunable external cavity laser, comprising:

a light source with an integrated light deflector comprising a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals, an active area for generating the optical signals, and the light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of a predetermined area of the passive optical waveguide;

a collimator lens for collimating a light beam emergent from the light source; and

a diffraction grating for changing a diffraction angle depending on a wavelength of the light beam through the collimator lens,

wherein the light beam propagation is deflected by modifying a refractive index of the core under the predetermined shape by applying a current or an electrical field to the light deflector.

16. The wavelength tunable external cavity laser according to claim 15, wherein the wavelength tunable external cavity laser further comprises a reflecting mirror for reflecting a specific wavelength diffracted by the diffraction grating.